

INHALANT ABUSE IN INDIAN COUNTRY

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For the sake of completeness, some controversial views are included in this report. The inclusion of any view or opinion does not represent the official positions of the Indian Health Service, Support Services International, Inc., or the authors.

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This report is presented in appreciation of the efforts of all persons trying to improve the quality of care provided to American Indians and Alaska Natives struggling to overcome substance abuse, especially the abuse of inhalants.

Contents

1.0	Definition of IA	1
1.1	Commonly Used Inhalants	2
2.0	History of IA	4
2.1	IA in Indian Country	4
2.2	IA in Other Cultures and Nations	6
3.0	Effects of IA	8
3.1	Signs and Symptoms of IA	8
3.2	Sudden Death Syndrome	9
3.3	Injuries Associated with IA	10
4.0	IA Abuse by Age and Gender	12
4.1	Age	12
4.2	Gender	14
5.0	Cultural, Socioeconomic, and Other Factors Associated with IA	15
5.1	Multifactor Explanation of IA	15
5.2	Cultural Factors	15
5.3	Emotional-Psychological Factors	18
5.4	Social Factors	18
5.5	Economic Factors	20
5.6	Pleasure	20
6.0	Characteristics of Inhalant Abusers	21
6.1	Young Inhalant User	21
6.2	Severe Psychosocial Problems	22
7.0	Etiology of IA	23
7.1	Early Peak Use	23
7.2	IA Epidemics	23
7.3	IA by Indian Youth	23
8.0	Promising Treatment Approaches	25
8.1	School-Based Intervention	25
8.2	Detoxification	26
8.3	Peer Patient Advocate	26
8.4	Other Therapeutic Approaches	26
9.0	Special Treatment Issues	28
9.1	Industry Responsibility	28
9.2	Change Needed To Address Inhalant and Other Drug Use	28
9.3	Treatment Issues	29

Inhalant Abuse in Indian Country

The purpose of this monograph is to describe the scope and nature of the problem of inhalant abuse (IA) by American Indians and Alaska Natives, and to describe promising prevention and treatment efforts. In many ways, IA is similar to other forms of substance abuse, such as excessive use of alcohol and other drugs including opiates, depressants, stimulants, and hallucinogens. This monograph focuses on the special features of IA and its relation to other forms of alcohol/substance abuse (A/SA) in Indian country.¹

In 1999 the Indian Health Service (IHS) convened a meeting of health care providers, consultants, and private sector providers to discuss the problem of IA in Indian country and to identify promising approaches to the treatment and prevention of IA (Canizales, Frank 2000). This monograph reflects some of the ideas presented in the conference as well as recent publications that focus on the problem. It is hoped that the information presented in this document will help inform the decisions of policymakers, program manager, service providers, and other stakeholders in the treatment and prevention of IA.

1.0 Definition of IA

Inhalant abuse refers to the intentional breathing or inhalation of any one of a diverse group of volatile compounds in gaseous form in order to alter one's consciousness. These volatile compounds are easily accessible since they are often found in household or commercial products, especially those containing toluene. Starting with paint products, glues, and gasoline, the number of abused compounds has increased to the point where, today, hundreds exist in the form of products bearing common brand names (Scatterday, 1994). Over a period of minutes, the inhalant abuser inhales a high concentration of an aerosol gas or gases from a source such as a spray can that contains paint or another inhalant. The concentration of the gases inhaled can reach 50 times the allowable concentration for industrial operations (Kerner, 1988).

In some regions of the country, IA among youth (often called "huffing" or "sniffing") is more prevalent than the use of the more highly publicized drugs such as cocaine, methamphetamine, LSD, and even marijuana. For example, self-report surveys in Texas indicated that at least one-in-five junior and senior high school students have used inhalants (Scatterday, 1994).

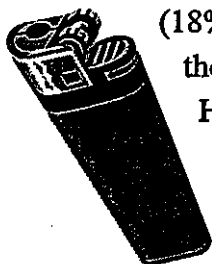
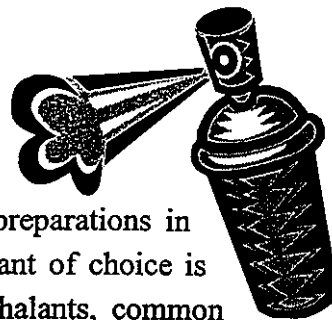
As with other forms of A/SA, inhalant abusers may be classified according to frequency of use: the one-time inhaler, the occasional or social inhaler, and the chronic dependent inhaler. Other methods of classification focus on the abuser's age and/or usage pattern: young

¹ In this monograph, "Indian country" refers to Indian Reservations, Alaska Native villages, the States of Oklahoma and California, and other areas where large numbers of American Indians or Alaska Natives reside.

inhalant users, adolescent poly-drug users who frequently use inhalants, and adult users (May and Del Vecchio, 1997).

1.1 Commonly Used Inhalants

The most common form of inhalants abused by the young are the volatile solvents, which include “glue, lighter fuel, paint thinners, degreasing compounds, gasoline, exhaust fumes, and hundreds of preparations in ordinary household and commercial use” (Kerner, 1988). The inhalant of choice is often determined by availability. Among Indian youth who use inhalants, common choices include gasoline (28%), glue (23%), paint removers and fingernail polish remover (18%), and paint sprays (17%) (Beauvais and Oetting, 1988). “Huffing” gasoline is thought to be the most prevalent form of IA in Indian country (Remington and Hoffman, 1984). Most of the substances inhaled contain mixtures of chemicals, making it almost impossible to determine which compounds are responsible for the effects experienced by the abuser and observed by therapists (Oetting, Edwards, and Beauvais, 1988).



Inhalation of gasoline tends to occur in isolated communities and on Indian reservations where unemployment is widespread and where few organized social activities are available to youth.² Lacking money and the availability of wholesome amusements, young people can easily stumble upon gasoline huffing as a way to fill their time and escape the tedium of poverty (Remington and Hoffman, 1984).



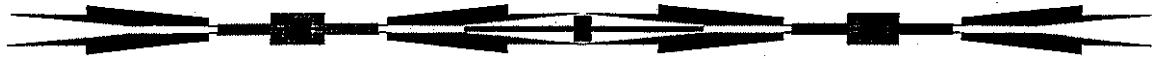
1.1.1 Lipophilic nature of inhalants. After being quickly absorbed in the lungs, volatile inhalants are deposited in organs and tissues that have high lipid or fatty contents and, thus, remain in the body for extended periods (Beauvais, 1997). The central and peripheral nervous systems, liver, peritoneum, pleura, pericardium, kidneys, and adrenal glands often absorb a high content of inhalant(s) after a single inhalation. The passage of deposits from these fatty tissues back to the bloodstream is characteristically low. This explains the lack of dramatic signs and symptoms of withdrawal, when IA is discontinued (Fornazzari, 1988).

IA is sometimes combined with drinking the liquid residue that is left in aerosol cans after sniffing the propellant. The liquid remaining after the propellant has been exhausted may contain alcohol or another intoxicant (Trotter, 1997). Quoting a young Navajo adolescent:

“And now the people on the Res are starting to drink hair spray.
They poke the bottom of it...and the air all inflates out and they

²In this document, “Indian reservations” refers to any land owned and occupied by an Indian tribe or Alaska Native village, and “Indian” refers to any member or descendent of an Indian tribe or Native Village.

take the top off...They took, like 5 bottles of Aquanet. In an hour they all passed out" (Id).



2.0 History of IA

Unlike most A/SA, IA has a relatively short history. Some scattered references to IA can be found in the early 1950s (e.g., Faucett, R.L., and Jensen, R., 1952). Before the 1950s, inhaling gasoline fumes and becoming intoxicated by them tended to be an accidental occurrence associated primarily with the petroleum industries (Machle, W., 1965). In 1967, Press and Done published an extensive piece in *The Journal of Pediatrics*, referring to IA as a serious problem that had spawned a series of epidemics in the United States. Their findings and proffered solutions recur throughout much of the subsequent research.

In the early 1980s, a study conducted in the United Kingdom argued that most inhalants, although “habit-forming,” are not physiologically addictive, unlike opiates, crack cocaine, sedatives, and tobacco. According to the researchers, inhalant users “seldom developed a tolerance or exhibited withdrawal symptoms resulting from disuse (Bowers and Sage, 1983).”³ Regardless of how addictive inhalants were judged to be in this study, it was reported that an average of two young people died each week from IA (Liss, 1989).

In the United States during the 1980s, IA became the only drug abuse problem monitored by the National Institute on Drug Abuse (NIDA) that demonstrated an overall increase in prevalence and was judged to be the problem “most resistant to drug use prevention efforts.” In the 1990s, IA emerged as the “drug use problem most likely to inflict serious damage upon youth,” even when there was only a passing involvement in IA (Scatterday, 1994).

2.1 IA in Indian Country



Although there are reports of gasoline huffing as early as the 1950's, little is known about how inhalants were introduced to Indian country. A 12-year study found that drug use among

Indian adolescents had increased sharply between 1975 and 1981 (Beauvais et al., 1988). In 1972, a study of 72 children in New Mexico revealed that gasoline huffing was the major form of drug use among a large percentage of the children in a pueblo community. The children's ages ranged from 6 to 12 years, with an equal number of boys and girls participating (Kaufman, 1973). In the 1980s, gasoline huffing had reached epidemic

³ Subsequent research studies linked the lack of dramatic withdrawal symptoms to the Lipophilic nature of inhalants (see Section 1.2.1).

proportions on many Indian reservations in Canada and among some urban Indians as well. Gasoline huffing was judged to have devastating effects on some Indian bands, to the point where practically all the members were involved (Smart, 1992).

Since 1985, some investigators have reported that IA in Indian Country has been steadily dropping. Unpublished data indicate that rates among Indian children may now be lower than among non-Indians (Beauvais, personal communication, 2000). The perceived decrease in the prevalence of IA in Indian country is supported by a study reporting that there was a lower utilization rate among American Indian youth than among Caucasians, Hispanic Americans, and Asian Americans (Howard and Jenson, 1999).

Members of the Kickapoo Tribe in Texas have been waging war against drug abuse since the early 1970s. The National Inhalant Prevention Coalition (NIPC) reported in its newsletter that 20 percent of the Kickapoo Tribe (about 90 of the 450 enrolled members) is "addicted to spray paint." Spray paint is the drug of choice, in part, because of its ready availability and low cost. It alleviates hunger, and the periods of intoxication induced last longer than those engendered by alcohol. Also, users report that the paint-induced hallucinations are easily incorporated into tribal traditions. The widespread growth of spray paint as an inhalant is all the more insidious because its use is often initiated in the young as a "gift from elders," one that "cannot be refused for risk of offense." (News Briefs, NIPC, 1997). A tribal elder stated that spray paint "threatens to do what 350 years of hardship could not: extinguish the traditional Kickapoo way of life from the earth." (Viewpoint, 1997).

2.1.1 IA by Alaska Natives. Little is known about the history of IA in Alaska Native communities. With its youthful population and its "last frontier" atmosphere, Alaska is a place where drinking and drug-taking behavior are considerably higher than in the "lower-48" States. Information from an Alaska Inhalant Survey (Prinz, 1999) helped to define the scope of the IA problem in Alaska Native communities. The 1995 Alaska Youth Behavioral Risk Survey reported 20 percent of middle school students (grades 7-8) had used an inhalant at least once. The same survey reported that 70 percent of middle and high school students in Alaska had used substances, and of the population, 29 percent had used an inhalant.



In March of 1998, an Alaska-wide workgroup began a study of incidence and prevalence of inhalant use and abuse. The planned approach uses three sample times over the course of 12 months. Initial survey data indicated that over one-third of youth in corrections facilities had used inhalants as had the majority (53%) of youth in A/SA treatment; 32 percent of adults in A/SA treatment had a history of using an inhalant at least once.

The costs associated with IA can be great. The Indian Health Service in Alaska has calculated the costs associated with the care and treatment of a young person (19 years old) with a history of chronic IA with resulting brain and organ damage to be \$1.6 million. These costs include:

- ❑ Acute and chronic medical care,
- ❑ Substance abuse treatment,
- ❑ Mental health treatment,
- ❑ Rehabilitative services,
- ❑ Social services,
- ❑ Law enforcement, and
- ❑ Possible adjudication through the courts.⁴

Like American Indians, Alaska Natives have to deal with the impact of industrialization and modernization on their traditional cultures, and conflict associated with a “clash of cultures” has been cited as an important factor that contributes to the abuse of alcohol and other drugs by indigenous peoples (Segal, 1997).

2.2 IA in Other Cultures and Nations

The fact that IA has been growing as an international problem is effectively underscored by a NIDA monograph (148), titled “Epidemiology of Inhalant Abuse: An International Prospective,” published in 1995. Increases in IA were reported from Asia and the Pacific Region, Bolivia, Brazil, Colombia, Hungary, Japan, Mexico, Nigeria, Peru, and the United Kingdom, and among the aboriginal peoples of Australia (Brady, 1990).

2.2.1 Latin America. It has been estimated that the majority of the approximately 20 million inhalant abusers native to Central and South America are children (Beauvais and Trimble, 1997). Many of these young abusers are “street children” who have run away from home and live in groups that serve as substitute families. Among Mexican elementary and junior high school students living in metropolitan areas, such as Mexico City, inhalants have been reported to be one of the drugs of choice (Tapia-Conyer, Cravioto, DeLaRosa, and Velez, 1995). The use of inhalants has spread mainly among children living in the poorest areas (Id).

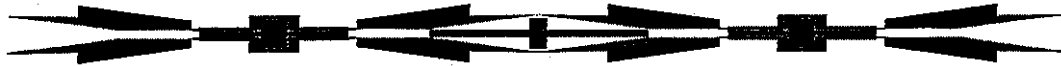


2.2.2 Mexican-American students. Among Mexican-American students, especially students who have problems in school, peer pressure has been found to be a factor in the growth of IA (Menon, Barrett, and Simpson, 1990). Such students often make fun of good students who accept school rules and try to instigate behavior that adults will find unacceptable (Id). In some cases, school authorities themselves may contribute to these problematic situations. Low expectations for poor and minority children, such as reflexively

⁴ Canizales, F. *Report of the Conference on Inhalant Abuse*, Indian Health Service, Rockville: MD. 2000.

giving negative feedback, are often embedded in teaching styles and classroom management practices. Considering that the dropout rate among Mexican-American youths is highest at or before the 9th grade level, substance abuse prevention should begin before they reach junior high school age (Id).

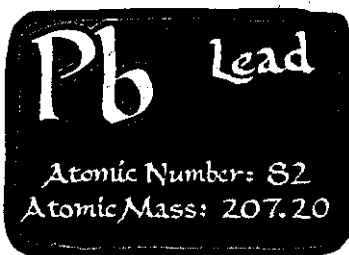
2.2.3 United Kingdom. In a research study conducted in the early 1980s, the use of inhalants, particularly glue-sniffing by adolescents, was described as a social ritual at schools: "glue being passed from boy to boy in a set order, not unlike [adults passing around] port [wine] at a dinner party." Children as young as five and six years of age used a wide variety of glues and nail polishes. Despite this usage, some analysts agreed that cigarette smoking might be more harmful than inhalants, noting that the "substances involved in IA are not physiologically addictive, and that glue sniffing can be a childish, albeit dangerous, prank that loses its glamour once adults cease to be upset by it." As the decade of the 1980s wound down, the somewhat nonchalant attitude of these researchers toward IA stood in contrast to the growing number of deaths from glue sniffing, reported in the United Kingdom (Bowers and Sage, 1983).



3.0 Effects of IA

An inherent danger of IA is that the majority of abused chemicals were never meant for consumption, either by humans or by animals. The products that are inhaled tend to be mixtures of many chemicals that individually and collectively have multiple toxic effects. The exact formulation of the product is often a trade secret; consequently, it is difficult to isolate the substances responsible for harming the abuser (Cohen, 1981).

Gasoline is one of the prime inhalants of choice in Indian country (see Section 1.1). The leaded variety of gasoline widely used in rural and remote areas contain 20 to 30 percent toluene, plus other toxins, such as hexane. Toluene causes central nervous system impairment, while the other toxins impair the peripheral nervous system, making the abusers vulnerable to severe motor and sensory neuropathy, which may inhibit their ability to walk (Fortenberry, 1985).



Tetraethyl lead, a constituent of leaded gasoline, causes long-term side effects such as ataxia, chorea, tremor, myoclonus, jaw-jerk reflex, postural tremor, and intention tremor. Occurring less frequently is an acute or subacute encephalopathic syndrome consisting of hallucinations, disorientation, insomnia, outbreaks of violence, and paranoia.

It is important to note that most of the effects to the central nervous system suffered by the chronic gasoline huffer eventually disappear, following abstinence and therapy, although recurrent or progressive encephalopathy has been reported. Chelation therapy has been prescribed for treatment of tetraethyl lead poisoning. This has been shown to be effective in reducing the lead-level in blood and in ameliorating the neurological symptoms (Fortenberry, 1985).

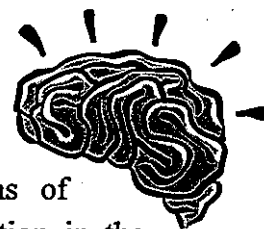
3.1 Signs and Symptoms of IA



The symptoms of IA vary in accordance with many factors, such as the types and amounts of substances inhaled, the time elapsed since inhalation, the environment in which the IA takes place, and the personality of the abuser. If encountered soon after an episode of IA, the abuser may be unconscious. If he/she is conscious, the abuser may appear to be intoxicated, exhibiting delirium, hallucinations, mental confusion, emotional disinhibition, dreamy reverie, euphoria, partial or total amnesia, with impaired perception and cognitive skills, and psychomotor clumsiness (Espeland, 1995). Other signs of IA include chemical odors on the breath and clothes, and stained skin (Id). Intoxication associated with IA often includes sensations of exhilaration, warmth, and lightheadedness

accompanied by a lack of motivation and by social inhibition (Cohen, 1981; Meadows and Verghese, 1996; Ramsey, Anderson, Blour, and Flanagan, 1989).

Effects of long-term abuse may include difficulty in concentrating, anxiety, depression, apathy, mood swings, irritability, depression, hostility, paranoia, and severe brain damage (Id). "Manifestations of cerebellum dysfunction include gait impairment with poor coordination in the standing position, heel-shin and finger-nose abnormalities, and postural and intentional 'dynamic' tremor..tingling and numbness in hands and feet may indicate peripheral neuropathy." (Id).



Acute poisoning can occur, in which case the "high" experienced may be followed by nausea and vomiting, dizziness, coughing, and increased salivation, and in more severe cases, by cardiac arrhythmias, convulsions, coma, and death (Meredith, Ruprah, Liddle, and Flanagan, 1989). Recovery from a nonlethal episode of IA normally occurs quickly. Once exposure has ceased, however, support for respiratory, renal, or hepatic failure may be needed as well as treatment for cardiac arrhythmias. Therapy with intravenous acetylcysteine should be considered in cases of acute carbon tetrachloride (lighter fluid, cleaning fluid) poisoning, although occurrences of this type are rare (Remington and Hoffman, 1984).

3.2 Sudden Death Syndrome

In an unknown proportion of episodes of IA, sudden death of the abuser may occur. IA can cause death in several ways. There can be sensitization of the cardiac conduction system with a resulting major cardiac arrhythmia (Cohen, 1981). Fluorinated hydrocarbons, such as Freon can produce severe intractable dysrhythmias, resulting in sudden death (Kurbat and Pollack, 1998). Another way IA can kill is by suffocation. The user may inhale in a closed space or with his head in a plastic bag, which can result in oxygen deprivation. The abuser may also lose consciousness and fall on or near the inhalant-containing material and become asphyxiated (Cohen, 1981).



While death rates associated with IA have not been reliably established, there have been numerous reports of its lethality. In greater London, 41 cases of sudden death from sniffing were reported during a five-year period (Billington, 1989). While many cases of organic tetraethyl lead poisoning are reported for each fatality, it is surmised that many deaths of children, for example, those living in the isolated Indian communities go unreported (Boeckx, 1997).

From 1987 to 1996, the State of Virginia recorded 39 deaths from IA, in which 70 percent of the victims were less than 22 years of age. These deaths did not include suicides or fatalities resulting from industrial accidents. Causes of death were reported as asphyxiation, cardiac dysfunction, and central nervous system depression, resulting from voluntary usage (Meadows and Verghese, 1996; Shepherd, 1989). In 1991, the American Association of Poison Control Centers reported 19 deaths due to intentional IA, involving youths ranging in age from 13 years to 19 years (Henretig, 1996). In 1985, deaths in the UK from IA reached 116 per year (Flanagan, Meredith, and Ramsey, 1989).

3.3 Injuries Associated with IA

Improper handling of drug paraphernalia while inhaling can cause serious injury, such as facial burns and severe frostbite from Freon. One particular case involved a person who sustained "cyanosis and swelling...over the nose and malar, together with a swollen tongue and eyes so swollen that they could not even be properly examined. It was finally determined that the patient had "extensive but superficial corneal abrasions" and required "surgical debridement and homografting to both upper eyelids and the left malar region." (Kurbat and Pollack, 1998).

3.3.1 Chronic effects. IA can damage multiple organ systems, including liver, kidneys, bone marrow, brain and peripheral nerves, heart, and lungs, depending on the inhalant abused (Cohen, 1981). Benzene causes severe anemia, leukopenia, and thrombocytopenia. Methylbutylketone causes sensory neuritis, which can eventually paralyze the respiratory muscles. Methanol, when swallowed or inhaled can cause dimness of vision and blindness (Id.; Marjot and McLeod, 1989; Meadows and Verghese, 1996; Ramsey et al., 1989; Remington and Hoffman, 1984; Ron, 1986). Clinical psychiatric impressions of long-term IA suggests impairment of thinking processes. It can cause impaired recall and confusion, a state that often persists even when the user is not under the influence. Nausea, vomiting, and abdominal cramps may be present in the intoxicated user. A variety of respiratory conditions are often observed, including bronchitis and pneumonia, both bacterial and viral strains. Initial symptoms might include sore throat, cough, and runny nose. Chronic encephalopathy and dementia are among the most serious consequences of inhalant exposure. Postmortem studies of some abusers have shown generalized axonal degeneration, demyelination, and brain atrophy (Lolin, 1989).

3.3.2 Psychological effects. Psychological effects of IA include a pattern of psychiatric morbidity. "Prolonged inhalant abuse can cause a protracted paranoid psychosis which is extremely slow to resolve." (Byrne and Kirby, 1989). In England, Jacobs found a correlation between depression and inhalant abusers in a comparison study undertaken with non-abusers. A causal relationship between depression and IA has yet to be established, since the

abusers reported “they inhaled inhalants because they felt depressed [which] makes it more likely that they were inherently depressed...” (Jacobs and Ghodse, 1987).

3.3.3 Cognitive effects. Brain damage associated with IA has been described above. Associated with this brain damage are cognitive deficits. Health providers in Indian country have reports that inhalant abusing children are, on the average, 3 full academic years behind their counter parts. This is based on findings with youth in treatment using the Kaufman educational testing scale where 5 percent of referrals were diagnosed with IA from referring agencies (Canizales, 2000).

3.3.4. Fetal effects. A study of six children from a small Indian community in Canada concluded that their profound retardation was caused by the fact that their mothers huffed leaded gasoline during pregnancy. While alcohol abuse may have been a factor in these cases as well, enough differences from fetal alcohol syndrome (FAS) were present to rule out alcohol as the sole contributor (Hunter, Thomas, and Evans, 1979). A 2-year study in Finland found a link between central nervous system defects in children born to mothers exposed to organic inhalants during pregnancy. Inhalants absorbed through the skin, lungs, and digestive tract can also cross the placenta where they cause embryo toxic effects (Holmberg, 1979).



4.0 IA Abuse by Age and Gender

The misconception that IA among the young marked a "harmless and passing phase" that was sometimes described as a passage "typical of normal adolescent development" has been gradually overturned as the frequency of sudden death among users has exposed the deadly danger inherent in IA (Scatterday, 1994).

Many researchers see IA as a critical and growing threat to the health of youth. For example, looking at IA across all groups, Henretig calls IA "an alarming and growing manifestation of substance abuse among American youth today." He cites "an alarming increase in substance abuse among younger students" and observes that infrequent or one-time use of inhalants may be associated with catastrophic events including death (Henretig, 1996). On the other hand, there is some evidence that IA in Indian country is decreasing (Beauvais, op. cit). One reason for this perceived decrease might be "the tremendous effort that Indian country has expended on prevention of IA" with a strong emphasis on community programs exposing the danger of inhalants (Id). Our Home Inc, an IA Treatment Program in Huron, SD developed a video "*Kids on Fire*" and an accompanying *Leaders Guide* for community-based providers. *Kids on Fire* deals with both IA prevention and intervention efforts in Indian Country.

4.1 Age

In general, inhalants are a drug of the young and the very young. The average age of inhalants users is 12 to 13 years of age with a range from 6-16 (American Academy of Pediatrics, 1966; Bowers and Sage, 1983). The peak of IA comes around the age of 13, with a sharp decline in the ensuing "teen" years. IA by very young people is doubly tragic. It carries with it the danger of protracted, if not permanent, brain dysfunction, especially when abuse occurs during the growth years when cellular structure is more sensitive to toxins than it is during adulthood. IA also retards the learning process at what is a critical juncture, when a youngster is passing from childhood into adolescence, a time when he/she ideally would be cultivating coping skills in order to deal with the basic problems of living and growing up (Cohen, 1981).



Inhalants are likely to be the first drug used by children (6-12 years), in part, due to their ready availability (Beauvais and Oetting, 1988). While research in this area is sparse, studies have focused on minority children and on "epidemic" episodes of IA in physically or socially isolated areas like northern Canada (Boeckx, Postl, and Coodin, 1977) and in a Pueblo Indian village (Kaufman, 1973). By their very nature, inhalants may be particularly attractive to children at an early age. One child was reported to have begun intentionally seeking out gasoline fumes at the age of 18 months (Fortenberry, 1985).

In the 1994 National Household Survey on Drug Abuse, sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), inhalants were found to be the third drug of choice selected by 8th, 10th, and 12th grade drug users during their lifetime. The only drugs listed as more popular than inhalants were alcohol and marijuana/hashish. Among students who used drugs during the prior year and during the prior month, as well as those who used drugs daily, inhalants again came in third behind alcohol and marijuana/hashish with the study's 8th grade population (National Institute on Drug and Alcohol Abuse, 1996).

The period of risk for drug use initiation among Indian youth is between the ages of 10 and 13 years, with the onset among some individuals being as young as 5 to 6 years of age (Okwumabua and Duryea, 1987). Inhalants, particularly gasoline, are used at an age earlier than any other substances (Thurman and Green, 1997; Mail and Johnson, 1993; Oetting et al., 1988). In a study of adolescents attending a boarding school, it was reported that Native Americans used substances at an earlier age than other groups (Id).

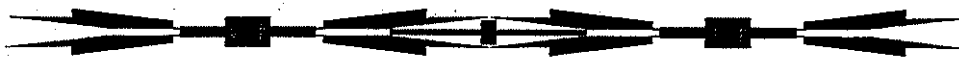
On the other hand, IA may be more prevalent among older youth than is indicated in much published research. By the time the population of youngsters has progressed to its late teens, those who have become more heavily involved with inhalants may not be attending high school; consequently, users in this age range are likely to be excluded from studies of inhalant use among their age group (Oetting, op. cit). Consistent with this view is the increasing lifetime use that has been reported by high school seniors—from 10 percent to 17 percent (Beauvais and Trimble, 1997).

A survey of Navajo 8th graders found that almost 25 percent have tried inhalants, with 12 percent having used inhalants in the previous month. This survey reinforced the findings of other studies that reported that the majority of inhalant abusers are young. This early usage underscores the need for early intervention involving schools, parents, and communities in order to reach children while they are still functioning within the school systems, even those as young as pre-school age (Trotter, Rolf, and Baldwin, 1997).

4.2 Gender

Early studies that concentrated mainly on specific groups, such as delinquents and psychiatric patients, showed much higher rates of IA among men and boys (Cohen, 1973; Korman et al., 1980). In Indian country, where usage was higher than in the general population, the gender differences tended to be small (Oetting, Edwards, and Beauvais, 1989; Beauvais, Oetting, and Edwards 1985; Beauvais and Oetting, 1988). Along with other disturbing trends, increased IA among females has been observed (Scatterday, 1994).⁵

Since inhalants are often used at an early age, girls often use inhalants before reaching sexual maturity. There is an obvious added danger of possible damage to the fetus should a woman abuse inhalants after becoming pregnant. It has been reported that women who huff gasoline during pregnancy tend to deliver infants who have birth defects such as neonatal hypotonia, a form of retardation, combined with scaphocephaly, a syndrome that gives the facial characteristics of high cheekbones combined with narrow foreheads (Hunter, et al., 1979). It has been suggested that young women inhalant abusers are highly susceptible to blood-related physical problems and symptoms, especially benzene poisoning, associated with huffing gasoline (Bruckner and Peterson, 1977).



⁵ Other disturbing trends include a correlation between IA and abuse of other substances, a greater potential for sudden death, and increased drug use in settings associated with youth violence.

5.0 Cultural, Socioeconomic, and Other Factors Associated with IA

Before addressing the special circumstances of IA in Indian country, it is useful to begin by considering some commonalities shared by all adolescent inhalers, including those in Indian communities. A review of the literature shows growing evidence that substance use by Indian youth is influenced by many of the same factors that lead non-Indian adolescents to use alcohol and other drugs. These influences include peer and parental modeling of substance use, misunderstanding the effects of drugs, lack of motivation to control substance use, inability to anticipate the consequences of substance use, inability to resist peer and other social pressure, developmental pressure to adopt "adult" behavior, desire to express solidarity with a particular peer group or subculture, and lack of alternative means for coping with depression, boredom, tension, and other negative emotions. (Gilchrest, et al., 1987). Oetting and others have expressed a similar view: "Indian youth are not a special deviant group. They are much like other youth, but are probably made more susceptible to drug use because of poverty, prejudice, and lack of economic, educational, and social opportunity." (Oetting, et al., 1988).

5.1 Multifactor Explanation of IA

Attempts to understand and explain A/SA in general, and IA in particular, include biological, behavioral or psychological, cultural, and economic factors or processes, among others. No single factor seems to account for why some persons engage in A/SA and others do not, nor can any one factor predict who will abuse alcohol and other drugs, nor when the abuse will occur (Segal, 1997; Gilchrest, Trimble, and Cvetkovich, 1987; Beauvais, et al., 1982). This point is well expressed by Segal:

"It is clear that any attempt to develop an explanation of drug-taking behavior, specifically inhalant use, needs to pursue how biological factors, which involve genetic and neurochemical processes, and behavioral factors, which include psychological, social and cultural factors, interact. It is also necessary to identify: (a) which factors mediate against drug involvement, (b) which factors contribute to the initiation of drug-taking behavior, and (c) which factors reinforce drug-taking behavior." (Id).

5.2 Cultural Factors

Some researchers have stressed the common aspects of A/SA and IA by American Indian/Alaska Native youth with those of youth in other cultures; other researchers have stressed the role culture plays in A/SA and IA. For example, Gilbert stressed that, "programs which fail to address the cultural confusion and alienation of the abuser are doomed to failure, as these factors are central to the perpetuation of substance abuse as an escape" (Gilbert, 1983).

5.2.1 Cultural conflict and disruption. Because of struggles associated with their transition from childhood to adulthood, dealing with the sometimes conflicting demands, expectations, and roles of their native and the dominant/colonizing cultures can be especially difficult for Indian youth. For some, alcohol and other drugs can be used to alleviate the stress associated with cultural conflict. This view suggests that interventions that focus on cultural issues and conflicts and which identify healthy ways to resolve such conflicts would be useful both in prevention and treatment of A/SA for such youth (Mocher, Holden, and Trimble, 1990). Cultural conflict has been advanced as a contributor to IA among American Indians and Hispanics in the United States and Canada and among aboriginal peoples in Australia and New Zealand.



“It can be concluded that a paint sniffer is a youth disengaged from the symbols and traditions of his/her culture or origin and concomitantly rejected by the majority culture.... The picture of the adolescent paint sniffer that emerges is one of an individual either “caught” between, or moving between, two cultures. He is neither accepting of, nor accepted by, either. ...The sniffer has been predisposed to abuse; specifically, his “disordered existence” predates his sniffing.... His inhalant intoxication provides a temporary, yet “cheap” and effective escape from his isolation....” (Gilbert, 1983).

Beauvais and Oetting suggested that high rates of A/SA by American Indians stem from “the effects of culture disruption...[which] leads to much more proximal causes of a host of social problems, including substance abuse.” With factors such as high unemployment, lack of a sense of personal control over internal affairs, lack of education and health care, “drugs and alcohol become an attractive alternative.” (Beauvais and Oetting, 1988).

Cultural conflict has been used to explain a “plague” of alcohol-related behaviors that involve violence and death, and disruptions of native families and communities throughout Alaska. Part of the conflict results from pressures exerted by the dominant culture on the minority group to change its way of life. The resulting crisis and stress, perpetuated over time, becomes cumulative, both on a group and on an individual level. Alaska’s development (e.g., construction of the oil pipeline, urban growth, implementation of technology) has significantly affected the ability of Alaska Natives to maintain their heritage of living with nature in Arctic and sub-Arctic environment (Franks, 1989).

For the young Indian abuser, whether because of denial, lack of education, an insular life style, or other reasons, there is often a lack of appreciation of the dangers associated with IA. Among 8th grade students polled in a survey, the percentage believing that drug abuse is

harmful was lower for students residing on reservations than for those living elsewhere (Beauvais, 1992).

5.2.2 Cultural factors compatible with A/SA. One researcher has advanced the controversial view that various aspects of a culture can be compatible with or even promote A/SA. Weibel-Orlando described Sioux culture as “breeding both delinquency and abusive drinking patterns.” The Sioux commitment to individual autonomy, combined with a laissez-faire tradition of child rearing, was said to foster parental tolerance of adolescent substance abuse. The adult Sioux’s strong belief in self-determination, i.e., one’s right to take care of himself/herself, prohibits him from intervening when his adolescent relatives exhibit A/SA, even though he/she may personally deplore such practices (Weibel-Orlando, 1984).

Weibel-Orlando finds fault with other tribal cultures, noting that mind-altering substances can play a direct and fundamental role in the cultural ethos of a tribe. The Plains Indians, whose culture stresses egalitarianism, sharing, and the assumption of personal responsibility, achieve these goals either through self-inflicted privation (the vision quest) or through the ingestion of hallucinogenic drugs (the peyote dream). Among abusers, sniffing and getting drunk are said to be socially acceptable forms of shared recreational activity, self-expression, and manifestation of ethnic identity. “Anything other than wholesale conformance to the social drinking norm is regarded as a rejection of group values.” (Weibel-Orlando, 1984).

5.2.3 Role of culture in A/SA healing and recovery. Lowery advocates tapping into the spirituality inherent in Indian culture and integrating it into the A/SA treatment programs.



She acknowledges that this “introduction of the spiritual...has elicited various [negative] responses,” but at the same time has been embraced in practice. To her way of thinking, “the profession has much work to do in providing adequate healing within a cultural context for American Indians.” A culturally

balanced approach to recovery would include: 1) healing the spirit, 2) working with kinship systems at gatherings and ceremonies, and 3) enhancing an understanding of the spiritual and a knowledge of an individual’s relationship with all things, including one’s extended family.

“We need to explore the impact of alcoholic behaviors on family systems and understand how this behavior impedes the emotional and spiritual development of peoples, tribes and nations. We need to pair the historical accounts of regional tribal groups with cultural practices of healing, grieving, and cleansing.... Our work must be developed within the context of the cultural and the spiritual.” (Lowery, 1998)

Consistent with the view that cultural integration promotes healing is the finding that boys and girls who participate in tribal activities are less likely to use inhalants than those who do not participate in tribal activities (Thurman and Green, 1997). Mail has urged that tribal A/SA treatment programs be comprehensive rather than simple copies of urban programs. Comprehensive treatment programs can include counseling, food banks, educational assistance, family recreation, arts, crafts, and oral histories (Mail and Johnson, 1993).

5.3 Emotional-Psychological Factors

It has been suggested that all forms of trauma, including cultural conflict, child neglect and abuse, and family violence, contribute to a cluster of symptoms known as post traumatic stress disorder (PTSD), which is directly linked to A/SA: "...drinking or drug use represents a self-medication process that is linked to a motive for use...[and] represents an immediate means of coping with personal discomfort." (Segal, 1997). Research sponsored by the IHS has shown that the majority of youth served by the YRTCs are victims of physical and/or sex abuse as are the majority of women served by IHS-funded A/SA treatment programs. This research has shown that the age when first abused is earlier than the age when the victim first used alcohol or other drugs (Hillabrant et al., 1996), Hillabrant et al., 2001).

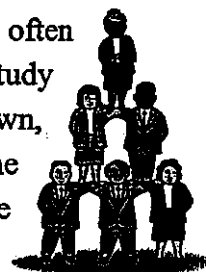
Negative expectations about the future are seen as playing a part in why a person starts abusing drugs. When there is little hope for a good job, little chance of success, or of getting what one wants out of life, drugs seem to offer at least temporary pleasure and provide the something to do. "Unless the fundamental underlying economic and social conditions on Indian reservations are changed, it will be hard to actually reduce the drug involvement of Indian youth." (Oetting, et al.1988). A daily environment where one is deprived of productive employment is a breeding ground for potential drug abuse (Kerner, 1988).



A study of adolescent inhalant abusers with delinquent backgrounds concluded that significantly more inhalant abusers were depressed than members of a comparison group of non-inhalant abusers. The fact that a large number reported that they used inhalants because they felt depressed suggests that they were inherently depressed and used inhalants as a form of self-medication (Jacobs and Ghodse, 1987).

5.4 Social Factors

5.4.1 Social Hierarchy of Substance Abusers. Abusers of other drugs often view inhalant abusers as belonging to a lower class of drug user. In a study focusing on Mexican-Americans living in a rural southwest Texas town, inhalants (while among the most easily available substances) were low on the list of preferred substances. IA was discovered to be less socially acceptable



than other drug usage. Often, inhalant abusers began using at an earlier age than abusers of other drugs. Another factor was that inhalant abusers were strongly influenced by whether their friends used or approved of the use of inhalants (Mata, 1988).

A study of Navajo youth found that teenagers had a negative view of the “sniffers” and “huffers” compared with other users. Sniffers were considered to look and even smell different from other kids. “Their eyes were kind of ‘crazy’ or weird looking.... If there is a hierarchy of drug users among Navajo teenagers, the ones who do inhalants are thought to be at the bottom of the social ladder.” (Trotter, et al.1997).

5.4.2 Dysfunctional Psychosocial Profile of Inhalant Abusers. A recent study of 5th and 6th grade urban Indian youth in Seattle found a strong correlation between IA and anti-social behavior in general. The person deemed to be at highest risk for IA was the aggressive, delinquent male of low socio-economic status and low self-esteem whose family background was rife with A/SA and violence. Aggressive behavior was found to be the most important predictor of IA. Inhalant users were also profiled as having an average annual household income, but significantly lower perceived self-worth than other drug users. Inhalant users exhibited personality traits that tended toward sensation seeking (Howard and Jenson, 1999).

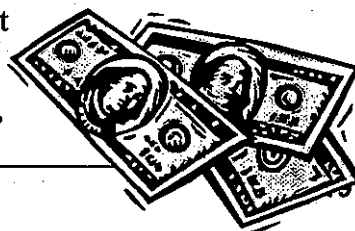
It seems likely that there is a reciprocal relationship between IA and social-behavioral problems. For example, a youth’s problems at school can be the result of IA, and can also induce the youth to use inhalants or other drugs to escape from these problems. Similarly IA can both create problems within the abuser’s family and can reflect family problems such as A/SA by other family members, or abuse and neglect by parents (Hillabrant, et al., 1996, Hillabrant et al., 2001).

5.4.3 Peer Influence. Several studies suggest that peer influence is an important factor in



IA. Young people, especially in Indian country, generally use inhalants with their peers in group settings, i.e., small groups of close friends who mutually encourage drug use and who use drugs together (Bowers and Sage 1983; Oetting, et al., 1989; Oetting, et al., 1988). In fact, it has been argued that peer influence is more strongly related to substance abuse than is ethnic identity (Howard and Jenson, 1999). The inhalant abuser who gets “high” with a group of peers enjoys a feeling of community and the illusion that there is “safety in numbers.” The experience of pleasure, excitement, and, sometimes terror when sharing hallucinations, can override boredom or a sense of despair (Kerner, 1988).

Among Navajo adolescents, the most common reasons to “get high” included: to participate in a shared experience with friends, to satisfy curiosity, to escape the harsh realities of life,



and to forget about personal problems. A teenager spoke of “doing drugs” because 1) older relatives, especially siblings, [were] doing them, 2) of wanting to go along with a particular group of friends, and 3) wanting to be “cool” (Trotter, et al.1997).

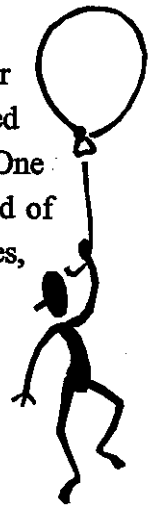
5.4.4 IA as precursor to other recreational drug use. IA is often associated with the use of other drugs. Because inhalants are often used first, IA is seen as setting the stage for drug abuse as a recreational activity; however, it has been argued that there is no causal link between IA and the use of other drugs. Inhalant users, who progress to other drugs, may be predisposed physically and psychosocially to any kind of substance abuse. Thus, IA is often “a passing phase...self-limiting...and that only a minority of chronic abusers progress to misuse of other substances.” (Edeh, 1989).

5.5 Economic Factors

Minimal cost and maximum availability are important factors governing IA. A can of spray paint may cost as little as \$1.00. Often, inhalants can be obtained free for the taking. Gasoline can be sniffed from most motor vehicles. Glues and inhalants are often found in the home, the school, and in many institutions. Adolescent A/SA treatment facilities must go to great lengths to keep inhalants in the form of common household products out of reach (Beauvais and Trimble, 1997).

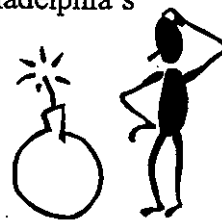
5.6 Pleasure

A study of Mexican-American adolescents found that the most important motivator for drug use was not peer pressure or family problems as the researcher had expected to discover. Instead, the prime motivator was curiosity and excitement about drugs. One subject revealed that his main reason for quitting IA was that he had become “tired of them [drugs] and [felt] the need to change [due to] family and other social pressures, [as well as] health concerns.” (Joe, 1989).



6.0 Characteristics of Inhalant Abusers

Inhalant abusers tend to have multiple psychosocial problems (Beauvais, 1997); (Oetting and Webb, 1992). A study of typical adult inhalant abusers, treated at Philadelphia's Lower Kensington Environmental Center, Inc. during the late 1970s, described those who eventually entered treatment as denying that they were drug users. They did not consider sniffing to be drug use, denied that they had a problem, and were resistant to entering treatment. They resided in a socially and economically depressed neighborhood and had such severe social, physical, and cognitive problems that they were incapable of responding to traditional forms of treatment (McSherry, 1988).



The inhalant abusers exhibited "a marked lack of abstract thought capability, were diseased, unhygienic, and smelled bad." Many of the chronic inhalant abusers had low reading and writing skills and could not perform basic tasks of daily life such as shopping at a store or using public transportation. Even though they tended to support themselves by means of petty thievery, prostitution, and by relying on public assistance, they could not be accurately called "street-wise." When intoxicated, they could easily be provoked into exhibiting explosive and aggressive behavior. The inhalant abusers who continued using inhalants into their adult years were seen as "losers" by peers who regarded sniffing as "kid stuff," since their own addictions had escalated to the use of "more sophisticated" drugs (Id).



One recent study found that heavy inhalant use was associated with a history of child abuse, but light inhalant use was not. It was concluded that child abuse may be an important correlate of extensive involvement in IA. Since inhalant users have more involvement with drugs than nonusers, the association between inhalant use and a history of child abuse may reflect a general relationship between child abuse and lifetime drug involvement." (Fendrich, Mackesy-Amitit, Wislar, and Goldstein, 1997).

6.1 Young Inhalant User

"Young Inhalant User" refers to a child who uses inhalants to the exclusion of other drugs, except alcohol or marijuana (Beauvais and Oetting, 1988). Young users gravitate to inhalants because they are free and readily available. As with marijuana, it is easy for "cautious" beginners to control the amount they use. Studies suggest there may be significant experimentation with inhalants by children less than 12 years of age and perhaps as young as 6 years of age, specifically in minority populations (Id).

Young people who use inhalants (especially gasoline and toluene) infrequently, and without indulging in bingeing, may incur only minimal short-term physical or neurological damage.

The potential for long-term damage increases with usage and IA may lead to the use of other dangerous drugs (Id).

6.2 Severe Psychosocial Problems

Some of the earliest studies characterized inhalant abusers as living on the margins of society, coming from dysfunctional families, and possessing both low self-esteem and low social skills. Later studies pointed out that IA could cut across a variety of socio-economic and age levels, as well as both genders. Such divergent findings may be reconciled by distinguishing between different groups of inhalant abusers. For example, occasional inhalant abusers are distinguished from chronic, dependent inhalant abusers along dimensions such as occasional versus chronic use and experimental/exploratory use versus use to escape PTSD or significant emotional problems (Beauvais, 1997; Oetting and Webb, 1992; Mata and Andrew, 1988). Thus, an occasional user may have relatively mild family, school, and other social problems, while a chronic user may be self-medicating to escape traumatic problems and memories.

Some studies have found an association between IA and anti-social behavior. Youths who used inhalants tended to have multiple problems with the juvenile justice system. Indian youth who engaged in IA (both on reservations and in urban communities) engaged in more anti-social activities more than their non-using counterparts (Howard and Jenson, 1999).

A study conducted at a boarding home found that impulsiveness along with a penchant for breaking rules was a significant predictor of IA among adolescent American Indian boys. Among both boys and girls, a cognitive deficit concerning "word problems" served as a similar marker (Thurman, 1990).



7.0 Etiology of IA

7.1 Early Peak Use

Inhalants have been reported as the drug-of-choice by children under 12 years-of-age, and peer sanction and encouragement correlated strongly with the levels of use. The greatest increase in usage is thought to occur between the ages of 11 and 13 years. It is further hypothesized that, if a youth has not experimented with inhalants by the time he/she is 16, it is unlikely that he/she will abuse inhalants at all (Beauvais and Oetting, 1988).

The early age of IA argues for prevention efforts targeting children in the primary grades. (Spiller and Krenzelok, 1997). Assertiveness training for children has been suggested to help children resist peer pressure to experiment with inhalants. The assertiveness training should be designed to enable a youngster to refuse to engage in sniffing with his/her peers in a way that is empowering and affirming to the youngster's dignity and that does not inevitably exclude the child from the company of peers in the long-term (Young, 1987).

7.2 IA Epidemics

Episodic outbreaks tend to take place when an inhalant is discovered (or rediscovered in a community) and its use spreads and then peaks (Beauvais, 1997); (Beauvais and Oetting, 1988). An inhalant epidemic may be fostered by a group of youth who become infatuated with inhalants and search for substances that produce highs. When one peer cluster gets involved with inhalants, their activity seems to spread to other peer clusters. The result is a situation where growing numbers of youths use inhalants when they are not directly supervised by an adult (Oetting, et al., 1988).

The availability of these inhalants and their legitimate uses as household cleaners and fuels make it practically impossible to control access to them. The prevalence of gasoline huffing in communities that have few organized activities for youths has led some Indian tribes in Canada to promote parental and community involvement in youth activities such as sports, outdoor recreation, and education (Shamattawa people, 1978; Remington and Hoffman, 1984).

7.3 IA by Indian Youth

High inhalant usage in Indian country, compared with that among non-Indians, has been associated with poverty, unemployment, and lack of opportunity on many reservations (Beauvais, 1997). School-based surveys of IA are thought to underestimate the true prevalence of IA because two high-risk groups tend to be excluded from the figures—absentee students and dropouts. This methodological problem is of no small consequence

because the absentee rate for Indian youths in many schools may be up to 40 percent of the Indian students, and because less than one-third of all Indian youths complete high school. "In all likelihood, inhalant use among Indian youth is significantly greater than the literature suggests." (Young, 1987).



8.0 Promising Treatment Approaches

Children and adolescents usually do not present willingly for A/SA treatment, so family, teacher, or other person must refer them. The time between first inhalant use and admission for treatment is over 3 years. Successful treatment of an unwilling inhalant abuser who may have cognitive deficits as well as a multitude of social and psychological problems is a formidable challenge. Effective treatment strategies for IA are in developmental stages. (Jumper-Thurman, Plested, and Beauvais, 1995).

Some treatment centers have been reluctant to admit inhalant abusers because their neurological impairments were once thought to be irreversible and inhalant abusers can be volatile and combative (Id.) Referrals to YRTCs from community agencies are not always accurate when a client's primary presenting problem is IA. The diagnosis may present the client as a poly-drug user. When the client is triaged at the treatment facility and IA is identified as the primary issue, the client may be referred to another facility. For example, adolescents with IA problems may be denied service by a facility with a primary focus on alcoholism treatment. Some treatment providers have advocated the development of programs to serve the special needs of inhalant abusers (Canizales, 2000).

8.1 School-Based Intervention

An Indian elementary boarding school in Oklahoma confronted an epidemic of IA and developed a successful intervention.

"The students not only engaged in IA, they would twist towels around their necks to produce a loss of consciousness. They obtained various inhalants for sniffing from stores in nearby towns and the maintenance shops on campus. The students stole gas from...cars...and tractors. They tried shoe polish, ink, lighter fluid, and nail polish remover. The gas jets in the science classroom had to be disconnected.... Sniffing was usually a group activity done in nearby woods or after lights-out in dormitory rooms" (Schottstaedt and Bjork, 1977).



The intervention included separation of the sniffing ringleaders from the rest of the student population, and dramatic enhancement of the social milieu of the boarding school. Before the intervention, the school milieu lacked warm and supportive interaction between the student residents and adult staff. Organized recreational activities were inadequate. These children were denied the usual accoutrements of a home, toys, personal possessions, and reading materials. In such a setting, IA offered solace, escape, entertainment, camaraderie, prestige, and gratification. Peer pressure enabled it to spread like a contagious

disease (Id). Other enhancements included the development of a volunteer program, upgrading extra-curricular activities, and increased one-on-one adult attention.

8.2 Detoxification

IA treatment often begins with medical management and detoxification. In the most severe cases, particularly those with a long history of IA abuse, abusers can suffer liver, kidney, blood, and neurological dysfunctions that may or may not be responsive to treatment. Blood chemistry analyses can uncover evidence of severe medical problems such as liver damage, even when an inhalant abuser reports no apparent physical symptoms or health problems (Joe, Garriott, and Simpson, 1991). In such cases, detoxification and intensive medical management may be required as with extreme abuse of alcohol and other drugs.

8.3 Peer Patient Advocate

In residential treatment centers, to deal with the young drug abuser who is resistant to treatment and hard-to-reach, a peer patient advocate can be assigned to shepherd the youth through the treatment process. This peer advocate, monitored by staff, works with a newly admitted youth, giving him/her someone to confide in who is of comparable age and often with a similar background and experience. Since peer patient advocates are selected based on the treatment process, they are valuable in orienting incoming youths to the treatment process and in providing them with support (Jumper-Thurman and Plested, 1995).

8.4 Other Therapeutic Approaches

8.4.1. Family Therapy. When family members act as enablers to substance abusers, family therapy should facilitate insight into the dynamics supporting the A/SA and changes in these dynamics. In cases involving child abuse and neglect, arrangement for safe living accommodations may be required. This can be especially overwhelming to clients lacking daily living skills, as chronic inhalant abusers often do. In these cases, there is a need for complete social and living rehabilitation, including work on reading and writing skills, psychomotor function training, and special education programs aimed at overcoming or mitigating memory and cognition defects.

8.4.2 Relapse Prevention in IA. IA, like other forms of A/SA, often involve relapse. What is different about IA is that more time is often needed to rehabilitate the inhalant abuser. For example, the inhalant abuser may need more time to learn adaptive behaviors and to recover from the biological effects of IA (McSherry, 1988).

8.4.3 Special Needs of Inhalant Abusers. McSherry has devised a low-key, non-intrusive treatment protocol that offered a drug-free arena, providing social and recreational activities

to the IA clients. He made the case that any treatment program targeting inhalant abusers should take into consideration the multiple deficits associated with IA, including resistance to treatment, denial of addiction or drug use, drug-induced cognitive and motor impairment.

Inhalant abusers often react to placement in a residential facility by exhibiting paranoid, hostile, and passive-aggressive behavior. Consequently, it may be appropriate to set the most basic goals and be prepared to give positive reinforcement in return for even the smallest demonstration of appropriate behavior on the part of these clients. IA clients are apt to become unusually dependent on the clinic, seeing its staff as a surrogate family, especially as they become more familiar with the setting and their counselors forge relationships with them. Thorough physical, psychiatric, and psychosocial evaluations are recommended, since clients are likely to be severely damaged in all these areas.



9.0 Special Treatment Issues

9.1 Industry Responsibility

Most of the household products involved in inhalant abuse are safe for the consumer when handled properly and in keeping with the purpose for which they were manufactured (Ramsey et al.1989). Even so, lowering the toxicity of aerosol products could decrease some of the deadly effects of IA and increase the safety of the products in appropriate uses within the home (Flanagan et al., 1989).

There is little evidence that legislation enacted to restrict the sale of inhalants has made any significant impact on curtailing IA. For example, in various States, efforts to legislate the sale of glue have backfired. So-called "sell laws" or "smell laws," passed against glue sniffing, simply encouraged inhalers to seek out other substances, such as aerosols, and resulted in driving sniffing underground. Furthermore, legislation mandating the detailed labeling of inhalants that was passed in California and Maryland had the effect of making it easier for young abusers to identify their substances of choice. The idea of adding unpleasant odors to inhalants has been abandoned because no suitable additives have been found (Liss, 1989).

9.2 Change Needed To Address Inhalant and Other Drug Use

Tribal governments and Federal agencies have agreed that the abuse of alcohol and other drugs is a major threat to the health of American Indians and Alaska Natives. The endemic quality of drug abuse among American Indian youth demands an intervention strategy that will simultaneously address multiple areas such as poverty, unemployment, schooling, family, and cultural-spiritual issues (Weibel-Orlando, 1984).

9.2.1. Prevention. Since research has shown increases in IA at the same time that other forms of substance abuse have declined, IA may not follow the same dynamics as the abuse of other drugs. The widespread accessibility of inhalants to American Indian youth complicates IA prevention and argues for continued special initiative against inhalants. Targeting of inhalants represents a departure from the once prevailing view among members of treatment, prevention, and research communities who paid scant attention to inhalants, dubbing them "orphan drugs." (Beauvais and Trimble, 1997; Trotter et al.1997).

Service providers have recommended that prevention efforts include ongoing development and dissemination of information for use by stakeholders in community education, partnering with schools, mental health, social services, substance abuse, medical facilities, and the organized religious community. These activities should involve collaboration among federal agencies, states, private sector, and philanthropic groups. Next, culturally appropriate

prevention models should be developed and tested for use by parents, teachers, and others (Canizales, 2000).

9.2.2 Multi-Modal Treatment. Inhalant abusers have been found to be more dysfunctional and more resistant to conventional prevention and treatment than other substance abusers (Beauvais and Trimble, 1997; Oetting and Webb, 1992; Jumper-Thurman et al., 1995). To be effective, treatment of IA requires a multi-pronged approach. Determining which therapy should be used in a given case must be based on an evaluation of the individual's physiological, psychological, and sociological circumstances (Young, 1987).

9.3 Treatment Issues

Because of the potential for sudden death and other threats to health, early identification of IA is especially important. A thorough IA assessment should include taking medical and drug histories, a medical examination, a psychological evaluation and assessment of level of dependency on inhalants and other drugs (Richardson, 1989). A important aspect of IA assessment is the determination of the extent of neurological damage sustained, as well as aid in the treatment planning of the individual being treated. Health service providers said that treatment of inhalant abusers requires collaboration among physicians, psychologists, addiction treatment counselors, nursing and other staff (Canizales, 2000).

9.3.1. Detox Treatment. One reason that inhalant abusers may require a longer detox period than other substance abusers is the lipophilic nature of inhalants, causing them to remain in the body for extended periods of time (see Section 1.1.1). (Beauvais, 1997; Fornazzari, 1988). Neurological impairment may also delay response to treatment. Currently, no evidence of reversibility from morphological changes exists. Studies have shown that patients experience only functional improvement. In other words, their motor coordination in day-to-day activities will improve, but a degree of cerebral and cerebellar atrophy can persist up to two years or longer after the last inhalation (Beauvais, 1997; Fornazzari, 1988). It has also been found that inhalants tend to be far more toxic than other drugs, including alcohol, and are much more likely to cause physical damage at lower dosages after shorter periods of use (Trotter et al.1997). Psychoactive drugs (e.g. neuroleptics and tranquilizers) generally play no role in the management of agitated or otherwise abnormally behaving inhalant abusers. Half-an-hour in an ER's "quiet room," with reassurances from a health care professional, can usually control any such behavior (Fornazzari, 1988).

Index

- aerosol cans, 4
- Aggressive, 20
- Alaska, 2, 4, 6, 7, 16, 17, 30
- Alaska Inhalant Survey, 6
- Alaska Native, 2, 4, 6, 16
- Alaska Youth Behavioral Risk Survey, 6
- American Academy of Pediatrics, 13
- Arctic and sub-Arctic environment, 18
- ataxia, 9
- Australia, 7, 17
- Benzene, 11
- blindness, 11
- boarding school, 14, 27
- brain, 7, 10, 11, 12, 13
- California, 2, 30
- Canada, 6, 12, 13, 17, 25
- cardiac, 10
- cerebral, 31
- Characteristics of IA, 23
- Chelation therapy, 9
- child abuse, 23, 28
- chorea, 9
- chronic inhalant abusers, 23, 28
- conflicts, 17
- corneal abrasions, 11
- Cultural conflict, 17
- culture disruption, 17
- cultures, 7, 16, 17
- death rates, 11
- degreasing compounds, 3
- delinquent, 20
- Detoxification, 28
- drug abuse, 5, 6, 18, 19, 21, 30
- dysfunctional families, 24
- dysrhythmias, 10
- embryo, 12
- encephalopathic syndrome, 9
- encephalopathy, 9, 12
- Etiology, 25
- family, 19, 20, 22, 24, 27, 28, 29, 30
- family violence, 19
- Federal, 30
- fetal alcohol syndrome, 12
- Freon, 10, 11
- gasoline, 3, 4, 5, 6, 9, 12, 21
- glue sniffing, 8
- Glues, 21
- hallucinations, 6, 9, 21
- hashish, 14
- hexane, 9
- Hispanics, 17
- huffing, 3, 4, 5, 15, 25
- Indian adolescents, 5, 16
- Indian Health Service, 7
- Indian youth, 3, 6, 14, 16, 17, 19, 20, 24, 26, 30
- inhalant users, 3, 5, 23
- inhalants, 5
- jaw-jerk reflex, 9
- Kickapoo Tribe, 6
- Kids on Fire, 13
- Latin America, 7
- lighter fuel, 3
- Lipophilic, 4
- majority culture, 17
- marijuana, 3, 14, 23
- Methanol, 11
- Mexican-American, 8, 22
- myoclonus, 9
- National Household Survey on Drug Abuse, 14
- National Institute on Drug Abuse, 5, 14
- NIDA, 7
- Navajo, 4, 14, 20, 21
- neurological, 9, 24, 27, 28, 31
- Oklahoma, 2, 27
- organ systems, 11
- Our Home Inc, 13
- oxygen deprivation, 10
- paint thinners, 3
- paranoia, 9, 10
- peer influence, 21
- period of risk, 14
- petroleum industries, 5
- physiologically addictive, 5, 8
- Plains Indians, 18
- Poison Control Centers, 11
- poisoning, 10, 15
- poly-drug user, 27
- pregnancy, 12, 15
- prevention efforts, 5, 25, 30
- psychiatric, 11, 12, 15, 29

Psychoactive, 31
relapse, 28
scaphocephaly, 15
sex abuse, 19
Sioux, 18
sniffing, 3, 4, 8, 11, 17, 18, 23, 25, 27, 30
Social Hierarchy, 20
spirituality, 18
spray paint, 6, 21
street children, 8
Substance Abuse and Mental Health
 Services Administration, 14
sudden death, 10, 11, 13, 15, 31
suffocation, 10
symptoms, 4, 5, 9, 11, 15, 19, 28
tetraethyl lead poisoning, 9, 11
therapy, 9, 28, 31
toluene, 3, 9, 24
trauma, 19
tremor, 9, 10
unemployment, 4, 17, 25, 30
United Kingdom, 7, 8
Virginia, 11
volatile inhalants, 4
withdrawal, 4, 5

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